

CLAIMS

What is claimed is:

1. A pivot port that can support a surgical  
instrument controlled by a robotic arm, comprising:

a pivot arm;

an adapter that has an aperture adapted to receive the  
surgical instrument; and,

a first joint that couples said adapter to said pivot  
arm.

2. The pivot port of claim 1, further comprising a  
second joint that couples said adapter to said pivot arm.

3. The pivot port of claim 2, further comprising a  
ring that supports said adapter and is coupled to said  
first and second joints.

1 4. The pivot port of claim 3, wherein said adapter  
2 includes a flange that is adjacent to an inner lip of said  
3 ring.

1 5. A pivot port that can support a surgical instrument  
2 controlled by a robotic arm, comprising:

3 a pivot arm; and,

4 a ball joint that is coupled to said pivot arm and has  
5 an aperture adapted to receive the surgical instrument.

6 6. The pivot port of claim 5, wherein said ball joint  
7 has a plurality of apertures.

1 7. The pivot port of claim 5, further comprising a  
2 ring that is attached to said pivot arm and supports said  
3 ball joint.

1 SubC2 8. A medical system, comprising:

2 a pivot arm;

3 an adapter that has an aperture;

4 a first joint that couples said adapter to said pivot  
5 arm;

6 a surgical instrument that extends through said  
7 aperture of said adapter; and,

8 a robotic arm that can move said surgical instrument.

9 SubC1 9. The system of claim 8, further comprising a second  
10 joint that couples said adapter to said pivot arm.

11 10. The system of claim 8, further comprising a ring  
12 that supports said adapter and is coupled to said first and  
13 second joints.

1        11. The system of claim 10, wherein said adapter  
2 includes a flange that is adjacent to an inner lip of said  
3 ring.

1        12. The system of claim 8, further comprising a  
2 support arm assembly that supports said pivot arm.

1        13. The system of claim 12, wherein said support arm  
2 assembly includes a table mount, a support arm coupled to  
3 said table mount and an end effector coupled to said  
4 support arm and said pivot arm.

1        14. The system of claim 13, wherein said support arm  
2 assembly includes a first linkage pivotally connected to  
3 said table mount, a second linkage pivotally connected to  
4 said first linkage, and a third linkage pivotally connected  
5 to said second linkage and said end effector.

1        15. A medical system, comprising:

2        a pivot arm;

3 a ball joint that is coupled to said pivot arm and has  
4 an adapter;

5 a surgical instrument that extends through said  
6 aperture of said ball joint; and,

7 a robotic arm that can move said surgical instrument.

1 16. The system of claim 15, wherein said ball joint  
2 has a plurality of apertures.

3 17. The system of claim 15, further comprising a ring  
4 that is attached to said pivot arm and supports said ball  
5 joint.

6 18. The system of claim 15, further comprising a  
7 support arm assembly that supports said pivot arm.

1 19. The system of claim 18, wherein said support arm  
2 assembly includes a table mount, an support arm coupled to  
3 said table mount and an end effector coupled to said  
4 support arm and said pivot arm.

1        20. The system of claim 19, wherein said support arm  
2 assembly includes a first linkage pivotally connected to  
3 said table mount, a second linkage pivotally connected to  
4 said first linkage, and a third linkage pivotally connected  
5 to said second linkage and said end effector.

1        21. A method for performing a medical procedure on a  
2 patient, comprising:

3            creating an opening in the patient;

4            locating a pivot port adjacent to the opening in the  
5 patient,

6            coupling a surgical instrument to the pivot port; and,

7            moving the surgical instrument with a robotic arm to  
8 perform the medical procedure.

1 22. The method of claim 21, wherein the surgical  
2 instrument is inserted through an aperture of an adapter of  
3 the pivot port.

4 23. The method of claim 21, wherein the patient has an  
5 open chest.

1 24. The method of claim 21, wherein the surgical  
2 instrument is inserted through an aperture of a ball joint  
3 of the pivot port.